

Description of four new species of *Cochlespira* (Gastropoda: Turridae) from the New World

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ABSTRACT. Four new species of *Cochlespira* from the New World are described and compared with their most similar congeners: *Cochlespira bevdeynzeræ* n. sp. and *C. leeana* n. sp. from the Caribbean coast of Colombia and Barbados; *C. cavalier*, from the west coast of Florida, Gulf of Mexico, USA, and *C. laurettamarrae* n. sp. from southern Panama.

INTRODUCTION

The genus *Cochlespira* is a well-defined, elegant group of turrids characterized by their elongated, pagodiform shells with a long siphonal canal, and whorls with a conspicuous peripheral keel ornamented with spinose projections. Only eight Recent species have been assigned to this genus. Four species have been described from the western Pacific: *Cochlespira pulchella* (Schepman, 1913) (with three other subspecies), *C. travancorica* (Smith E. A., 1896), *C. kuroharae* (Kuroda, 1959), and *C. beuteli* (Powell, 1969); one from the eastern Pacific: *C. cedonulli* (Reeve, 1843); and three from the western Atlantic: *C. elegans* (Dall, 1881), *C. radiata* (Dall, 1889), and *C. elongata* Simone, 1999. As shown by the dates of publication, only four species were published in the 20th century. As *Cochlespira* species inhabit deep to very deep water, usually in very soft bottom, many species of this genus have been difficult to collect, mainly by means of research vessels and as by-catch of commercial trawlers and dredging vessels.

The Panamic Province species described herein was obtained from trawlers working in deep water off Punta Mala, at the entrance of Panama Bay, southern Panama, and nearby Chiriquí Bay; the two Colombian species were collected by commercial dredging and trawling operations off Cabo de la Vela, in eastern Colombia and Barbados, and the Gulf of Mexico species was dredged by Mr. Jim Moore who, operating his own boat, dredged along the offshore waters of the northeastern Gulf of Mexico in the early 1960's. This last, very remarkable species, was a surprising find, as the waters off the west coast of Florida are among the best sampled in the United States.

The description of these four species increases the number of taxa assigned to *Cochlespira* by 50%.

Abbreviations

ANSP: Academy of Natural Sciences, Philadelphia, Pennsylvania, USA.

EFG: author's collection

HGL: Harry G. Lee collection, Jacksonville, Florida

UF: University of Florida, Florida Museum of Natural History, Gainesville, Florida.

dd: empty shell

lv: live mollusk

SYSTEMATICS

Superfamily **CONOIDEA** Fleming, 1822

Family **TURRIDAE** Swainson, 1840

Subfamily **COCHLESPIRINAE** Powell, 1942

Genus *Cochlespira* Conrad, 1865

Type species: *Pleurotoma cristata* Conrad, 1847 (by virtual monotypy)

Cochlespira bevdeynzeræ n. sp.

Figs 1-3

Type material. Holotype 46.5 mm in length, ANSP 424277 1 dd. Paratypes: 1 dd, 50 mm in length, Colombia, off Taganga, 11°17.320'N, 74°12.427'W, in 200 m, Enrique Yidi col., Barranquilla, Colombia.; 1 dd, 45.6 mm in length, Colombia, off Guajira Peninsula, trawled in approximately 500 m, EFG 29936.

Type locality. Colombia, off Cabo de la Vela (12° 12' N, 72°10'W), Guajira Peninsula(also spelled Goajira), in deep water.

Distribution. Known only from the type locality.

Description. Holotype 46.5 mm in length, elongate-pagodiform (width/ length ratio without spines: 0.338), surface glossy. Protoconch damaged;

remaining portion of last protoconch whorl smooth. Teleoconch of 7 sharply angular, strongly keeled whorls; keel positioned slightly anterior to center on first two whorls, gradually moving to mid-shoulder slope on later whorls; edge of keel ornamented with sharply erected spines (Fig. 3); 17 spines on each of last two whorls; shoulder slope ornamented with a thin, sharply raised carina; carina positioned next to keel on early whorls, advancing to mid-shoulder on later whorls, creating a strongly concave surface adapically. Suture impressed. Axial ornamentation composed of arcuate lines between carina and suture, oblique ribs between mid-shoulder carina and keel (Fig. 3), and axially oriented lines below keel. Spiral sculpture absent, except for slightly oblique, evanescent threads on siphonal canal. Sinus U-shaped, deep, occupying area between mid-shoulder carina and suture. Total length of aperture 29.9 mm; anterior canal approximately 19.5 mm in length, slightly twisted to the left, constricted by weak columellar callus at anterior end, opening wider anteriorly. Columellar callus thin, posteriorly recurved to meet suture, whitish tan, posterior half smooth; weak, oblique lines caused by spiral ornamentation showing on anterior half. Shell whitish, profusely marked with axially oriented streaks of light and dark tan coloration; darker lines running from central shoulder carina to adapertural half of spines (Fig. 3). Operculum unknown.

Discussion. *Cochlespira bevdeynzeriae* differs from *Cochlespira elegans* (Fig. 5), *C. elongata* (Fig. 4) and *C. radiata* (Figs 18-20), the three Atlantic species, by not having spiral ornamentation in its teleoconch whorls; moreover, the new species grows to 46.5 mm, while *C. elongata* grows to only 37 mm (Simone, 1999:106) and *C. radiata* to 32 mm (Rosenberg, 2009). *Cochlespira elegans* does grow up to 60 mm (Rosenberg, 2009), but its granulose surface, double row of projections at the periphery and lack of a mid-shoulder carina further differentiate it from the new species.

Cochlespira bevdeynzeriae is most similar to the Panamic species *C. laurettamarrae* n. sp. (Figs 6-10), described herein; both species grow to a similarly large size and lack spiral ornamentation except on the siphonal canal. However, *C. laurettamarrae* is white

and has a lusterless surface, fewer spines on last two whorls (compare Figs 3 and 8), and a shorter siphonal canal,

Etymology. Named for Mrs. Beverly Deynzer, of Sanibel Island, Florida. Mr. Al Deynzer, her husband and a well-known collector of Mitridae and Costellariidae, donated the holotype and asked that the species be named for her in celebration of their 50th wedding anniversary.

Cochlespira cavalier n. sp.
Figs 12-17

Type material. Holotype 29.5 mm in length, ANSP 424280 1 dd.

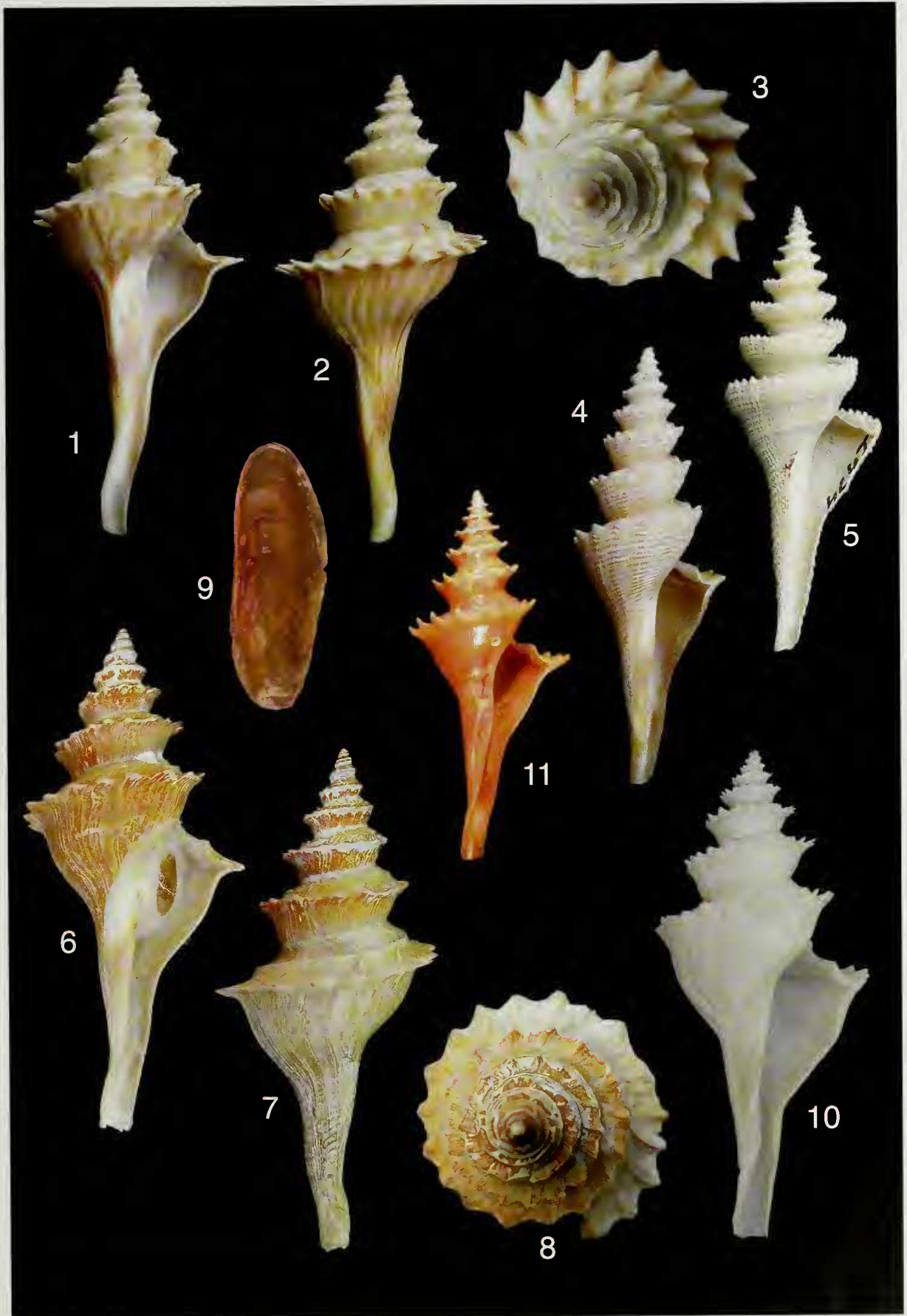
Type locality. Florida, west of Egmont Key (27° 36' 0.3"N, 82° 45' 39"W), Hillsborough Co, in 85 m.

Distribution. Known only from the type locality.

Description. Holotype 29.5 mm in length, only slightly glossy, narrowly pagodiform (width/length ratio without spines: 0.254). Protoconch eroded, of approximately two whorls. Teleoconch of 7.5 sharply angular, strongly keeled whorls; keel appearing slightly anterior to center on early whorls, positioned at mid-shoulder on later whorls, ornamented with small, sharply pointed, adapically oriented, triangular spines; 25 spines on each of last two whorls. Axial ornamentation lacking. Spiral ornamentation of two cords on shoulder, immediately adjacent to peripheral keel (Fig. 17); well-incised cords starting to appear below keel on forth whorl; 7 cords, somewhat uneven in width, showing on penultimate whorl, and 8 on last whorl; last whorl showing a stronger, carinated cord at sutural level (Fig. 15); approximately 25 cords appearing anterior to carinated cord; cords on siphonal canal pustulose, creating a grate-like appearance (Fig. 16). Sinus U-shaped, fully occupying shoulder of whorl (Fig. 17). Total length of aperture 14.5 mm; length of siphonal canal 10.3 mm; columellar callus white, glossy, posteriorly recurved at level of suture; lirations from spiral ornamentation vaguely showing through surface. Shell egg-white in coloration. Operculum unknown.

Figures 1-11

1-3. *Cochlespira bevdeynzeriae* n. sp. Holotype ANSP 424277 length 46.5 mm, width (without spines) 15.7 mm, off Cabo de la Vela (12° 12' N, 72°10'W), Goajira Peninsula, Colombia, in deep water. **4.** *Cochlespira elongata* Simone, 1999. Trawled off Santos, São Paulo State, Brazil, in 100-150 m, 32.8 mm in length (EFG 26705). **5.** *Cochlespira elegans* (Dall, 1881). off Egmont Key, west Florida, dredged in 420 m, length 40.5 mm (EFG 4647). **6-10.** *Cochlespira laurettamarrae* n. sp. **6-9.** Holotype ANSP 424278 length 57.2 mm, width (without spines) 21.5 mm, off Punta Mala (7° 28' 0" N, 80° 0' 0" W), west entrance to Bahía de Panamá, southern Panamá, in 245 to 300 m. **10.** Paratype EFG 29641 length 52.4 mm, width (without spines) 16.5 mm, Golfo de Chiriquí, southern Panama, in 300 m. **11.** *Cochlespira cedonulli* (Reeve, 1843), Costa Rica, 9°23.80'N. , 84°36.70'W, in 45 m, length 19.6 mm (EFG 26878).



Discussion. *Cochlespira cavalier* can readily be differentiated from *Cochlespira radiata* (Figs 18-20), a Gulf of Mexico and Caribbean species, by its more elongated profile, shorter, more numerous spines on keel (compare Figs 14 and 19), the absence of a central shoulder carina (compare Figs 17 and 19), a carinated spiral cord at the base of the last whorl (Fig. 15), and pustulose, grate-like ornamentation on siphonal canal (Fig. 16). This canal ornamentation is very similar to that of *Cochlespira elegans* (Fig. 5), another Gulf of Mexico and Caribbean species, but "in this species the anterior part of the whorls is covered with granulose spirals" (Dall, 1889: 78), not just the canal. Although *Cochlespira cavalier* shares with *C. elegans* the lack of a mid-shoulder carina, the latter grows much larger in size, and has a double crown of numerous, small projection on its keel. *Cochlespira elongata* (Fig. 4), from Brazil, has a mid-shoulder carina, is "pale cream to pale brown in coloration" (Simone, 1999: 106), has a different surface sculpture, and lacks the secondary carinated spiral cord on the last whorl.

Etymology. Named for the ship Cavalier, the vessel used by Mr. Jim Moore, a well-known mariner who dredged offshore in the northwestern quadrant of the Gulf of Mexico in the early 1960's. The specific epithet is used here as a noun in apposition.

Cochlespira laurettamarrae n. sp.
Figs 6-10

Type material. Holotype 57.2 mm in length, ANSP 424278 1 lv - Paratype, 52.4 mm in length, EFG 29641. Golfo de Chiriquí, southern Panamá, in 300 m. 1 dd.

Type locality. Panamá, off Punta Mala (7° 28' 0" N, 80° 0' 0" W), west entrance to Bahía de Panamá, 245 to 300 m.

Distribution. Known only from the type material.

Description. Holotype 57.2 mm in length. lusterless, elongate pagodiform (width/ length ratio without spines: 0.376). Protoconch missing. Teleoconch of 7, sharply angular, strongly keeled whorls; keel appearing somewhat posterior to center of whorls; edge of keel ornamented with rather low, wide,

triangular spines; 20 spines on each of last two whorl (Fig. 8); mid-shoulder slope ornamented with sharp, raised carina that divides shoulder into two equal, slightly concave areas; carina somewhat crenulated by axial ornamentation. Suture impressed. Axial ornamentation of arcuate lines between mid-shoulder carina and suture, and low, oblique cords between mid-shoulder carina and keel, becoming axially oriented below keel. Spiral ornamentation lacking except for siphonal canal, where strong, somewhat undulating cords appear; cords becoming somewhat granulose when intersecting axial ornamentation. Sinus U-shaped, deep, occupying area between mid-shoulder carina and suture. Total length of aperture 33.5 mm; anterior canal approximately 16.5 mm in length. Columellar callus posteriorly arched to meet sutural line, smooth, thin but conspicuously separated from rest of whorl by slightly incised line, milky-white. Shell color white, stained brownish-yellow by floor deposits. Operculum 7.4 mm in length, pale tan, leaf shaped, with terminal nucleus (Fig. 9).

Discussion. The paratype (Fig. 10) is slightly narrower than the holotype, measuring 52.4 mm in length and 16.5 mm in width (without spines). It has 22 spines on the penultimate whorl and 24 on the last. Its spines are more adapically directed than those of the holotype, which are almost vertical to axis. This specimen was previously reported by the author as a probable undescribed species (García, 2001).

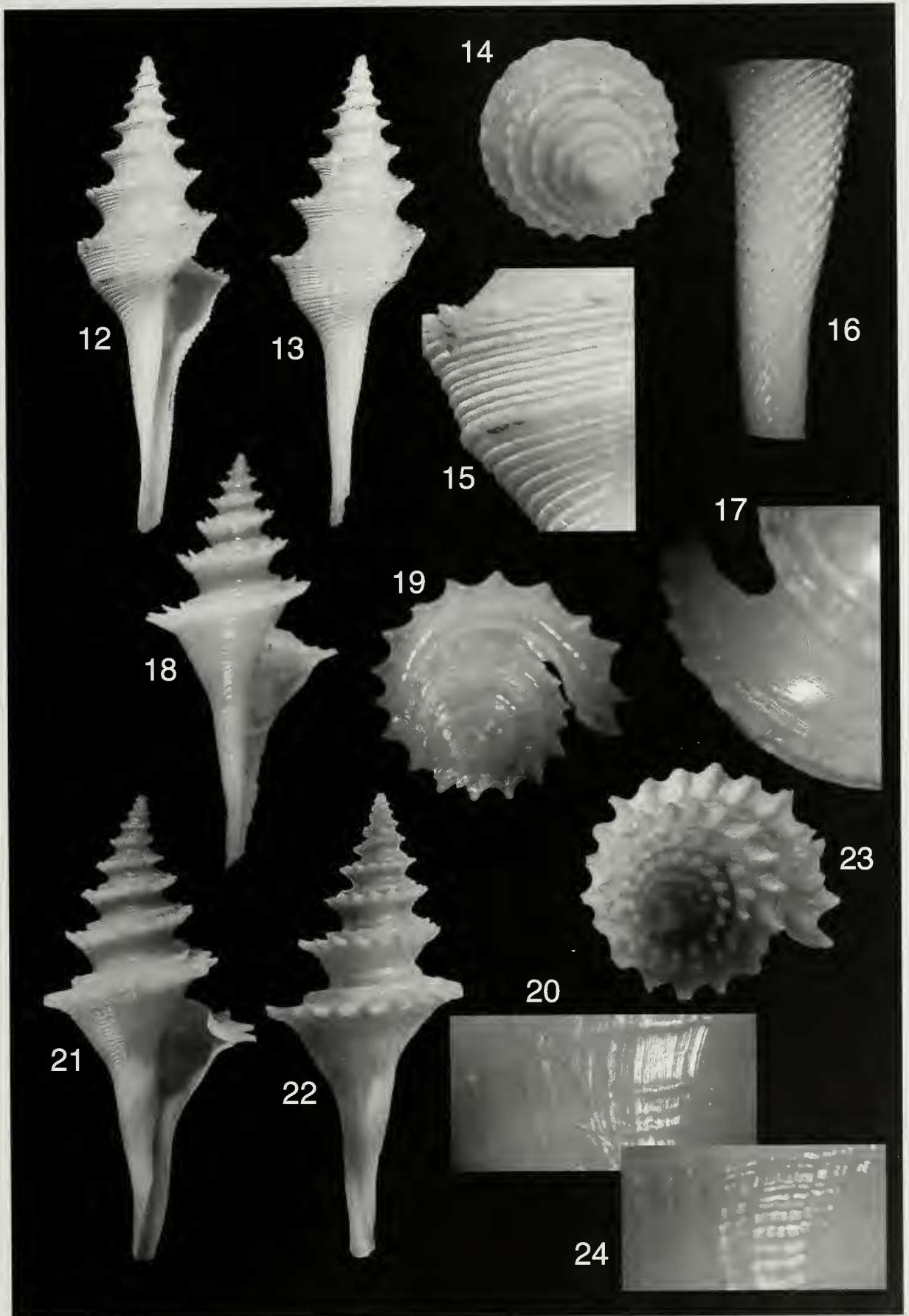
Cochlespira laurettamarrae differs from *C. cedonulli* (Fig. 11), its only congener from the eastern Pacific, by its larger size, its lusterless, white shell instead of the tan coloration and polished, almost smooth surface of *C. cedonulli*, and its less pointed, more numerous spines on the mid-whorl keel.

Cochlespira laurettamarrae is most similar to the Caribbean species *C. bevdeynzeriae*, described herein. Both species grow to a similarly large size and lack spiral ornamentation except on the siphonal canal. However, *C. laurettamarrae* is white and has a lusterless surface, more numerous spines on the last two whorls (compare Figs 3 and 8), and a shorter siphonal canal,

Etymology. Named for Mrs. Laretta Marr, of Johnson City, Tennessee, USA, an enthusiastic collector of Panama shell and donor of the type material.

Figures 12-24

12-17. *Cochlespira cavalier* n. sp. Holotype ANSP 424280 length 29.5 mm, width (without spines) 7.5 mm, west of Egmont Key (27° 36' 0.3"N, 82° 45' 39"W), Hillsborough Co, western Florida, in 85 m. **18-20.** *Cochlespira radiata* (Dall, 1889), off Egmont Key, western Florida, in 200 m, length 16.5 mm (EFG 4303). **21-24.** *Cochlespira leeana* n. sp. Holotype ANSP 424279 length 24 mm, width (without pines) 18.5 mm, off Cabo de la Vela (12° 12' N, 72°10'W), Guajira Peninsula, Colombia, in deep water.



Cochlespira leeana n. sp.
Figs 21-24

Type material. Holotype ANSP 424279 24 mm, 1 dd. Paratypes 1: 18.5 mm, UF 436393 paratype 2: 22.8 mm, HGL collection; 3: EFG 29642; all Barbados, west of Sandy Lane Bay, St. James, 184- 200 m., 3 dd.

Type locality. Colombia, off Cabo de la Vela (12° 12' N, 72°10'W), Guajira Peninsula (also spelled Goajira), in 80 to 100 m.

Distribution. Known only from Colombia and Barbados.

Description. Holotype 24 mm in length, semi-glossy, elongate pagodiform (width/ length ratio without spines 0.77). Protoconch damaged, remaining portion of last whorl smooth. Teleoconch of 9 sharply angular, strongly keeled whorls; keel appearing slightly anterior to center on early whorls, becoming more centered on later whorls, ornamented with sharply pointed, triangular spines (Fig. 23); 19 spines on penultimate whorl and 20 spines on last whorl; a strong, erect, carina appearing at mid-shoulder slope; carina clearly visible in shell profile, creating a deep concave area adapically. Suture shallow, rather inconspicuous. Axial ornamentation composed of adaperturally arcuate growth lines between mid-shoulder carina and suture, strong oblique ribs between mid-shoulder carina and end of spines, and crowded, weaker axial threads below keel. Spiral ornamentation (other than mid-shoulder carina) absent on shoulder slope; numerous, low, conspicuous spiral cords appearing below keel, stronger adapically, becoming corrugated as they cross axial ornamentation (Fig. 24), covering entire surface of last whorl. Sinus U- shaped, deep, occupying entire surface between mid-shoulder carina and suture. Total length of aperture 13.8 mm; length of siphonal canal approximately 7.3 mm; a thin, short, white, smooth columellar callus appearing at level of keel; spiral ornamentation showing through surface anterior to callus. Shell yellowish tan, with three slightly darker spiral bands on last whorl: one below keel, one at posterior end of siphonal canal, and one at mid-canal; darker, slightly oblique, axially oriented dashes appearing on shoulder, from edge of mid-shoulder to adapertural half of spines (Fig. 23), color also showing on abapical side of spines. Operculum unknown.

Discussion. The three paratypes from Barbados are bleached white, but all three show faint remnants of the three spiral bands on the dorsal side of the last whorl, and the largest shows faint tan markings on several of the spines on the keel of the last whorl. Otherwise, the three paratypes show all pertinent characters of the holotype.

The broadly pagodiform shape of *Cochlespira leeana* differentiates it from the slender profile of the

Atlantic species *Cochlespira elegans* (Fig. 5), *C. elongata* (Fig. 4) and *C. cavalier* n. sp. (Figs 12-13). The new species is most similar to *Cochlespira radiata*; however, the latter has different markings, has a more glossy, thinner, more translucent shell, weaker axial ornamentation between mid-shoulder carina and keel, less numerous spines on peripheral keel (compare Figs 19 and 23), and spiral threads that are "less crowded near the keel" (Dall, 1989: 78) (compare Figs 20 and 24). Although it has been reported living throughout the arch of the Lesser Antilles down to Barbados (Rosenberg, 2009), *Cochlespira radiata* was not reported from Colombia by Díaz & Puyana (1994: 219) or from Venezuela by Macsotay & Campos (2001).

Cochlespira leeana can also be mistaken with *C. cedonulli* (Fig. 11), from the Panamic Province. The overall coloration and general structure of both species are very similar, but *C. cedonulli* has a solid tan coloration, instead of the specific bands and dashes of *C. leeana*, has fewer, more widely-triangular spines, and an almost smooth surface.

Etymology. Named for Dr. Harry G. Lee, of Jacksonville, Florida, well-known shell collector and author of many malacological publications. Dr. Lee brought the new species to my attention and donated the holotype.

ACKNOWLEDGEMENTS

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